

ROYAL COMMISSION
ON
AGRICULTURE IN INDIA

INTRODUCTION
TO
VOLUME II

EVIDENCE
TAKEN IN THE
BOMBAY PRESIDENCY



BOMBAY
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CONTENTS

	PAGE
1. General Features .. .	3
2. Provincial Income and Expenditure ..	5
3. Revenue Administration and Land Records ..	8
4. The Cultivator	10
5. The Agricultural Department	12
6. The Veterinary Department	18
7. Irrigation	18
8. Forestry in relation to Agriculture	20
9. General Education	21
10. Co-operation	23
11. Communications and Marketing	25
12. Local Self-Government	27
13. Public Health and Sanitation	28
MAP	<i>facing page</i> 3
GRAPH	<i>facing page</i> 5

BOMBAY

1. GENERAL FEATURES.

The Presidency of Bombay, including Sind, has an area of 187,000 square miles and a population of 26·8 millions. The British districts alone contain an area of 124,000 square miles and a total population of 19·7 millions. The presidency is thus somewhat bigger than Great Britain and Ireland combined. It has a coast line of 1,534 miles on the west, and it extends from Baluchistan in the north to Madras in the south and is bounded on the east by the Nizam's Dominions, the Central Provinces and the Central India States.

The presidency covers 14 degrees of latitude from 14° to 28° north and exhibits considerable variations both as regards climate and physical features. Excluding Sind (which is dealt with separately) the presidency may be divided into four divisions, Gujarat, Deccan, Karnatak and Konkan.

The northern section, Gujarat, stands slightly above sea level and has a fertile soil and a dense population. It is sometimes called the Garden of India. It is watered by several rivers, the most important of which are the Narbada, the Tapti, and the Sabarmati. The northern part comprising Ahmedabad and Kaira forms part of the great alluvial plains of northern and central India. The soil here is formed from gneissic and metamorphic rocks and is alluvial and deep. It varies from drift sand in the north to fertile loam in parts of Kaira. The southern Gujarat tract is also essentially alluvial. The alluvium is deep and has all the characteristics of black cotton soil. The Panoh Mahals tract differs from anything found elsewhere in the presidency. It is an undulating area in which the soil is shallow in the higher lands, while the low lying tracts are composed of deep rich loam.

In the centre of the presidency is the Deccan plateau with an average altitude of 2,000 feet comprising three different types of country. Of these, Khandosh is akin to the plains of the Central Provinces and contains rich fields of black cotton soil growing excellent cotton and wheat. It is a richer tract than the rest of the Deccan. The western hills are covered with jungle, in which small hamlets are established wherever the soil is cultivable. To the east of these lies the main plateau traversed by the streams that eventually find their way to the Godavari and the Kistna. The soil is generally shallow but contains rich alluvial pockets. The rainfall is uncertain, and this area is constantly liable to drought and famine.

The Karnatak lies to the south of the Deccan at about the same altitude and contains a trap area which passes into a transition tract between the trap rocks to the north and the metamorphic rocks to the

south. This transition tract is rich and contains some of the deepest and most retentive black soils in the presidency.

The Konkan lies between the coast and the Western Ghats and consists of narrow elongated strips, hilly and difficult to traverse. The soil is usually shallow and poor and except on the coast there is little level land. In the valleys there are rice-fields, gardens, and mango orchards.

There is one feature which is common to the larger part of the presidency. Most of the soils are derived from the disintegration and decomposition of the Deccan trap, though granite and gneiss appear in the extreme north.

The rain falls mainly between the months of June and October, but some parts receive later rain in November and December. The south-west monsoon strikes the west coast and works its way north towards Gujarat. As it advances, the amount of precipitation decreases along the coast. While the extreme south receives as much as 150 inches, places 200 miles to the north receive only 100. The monsoon travelling inland is arrested by the higher range of the Western Ghats where the precipitation reaches 200 inches. A very few miles eastwards there is a rapid decrease in the fall. On the basis of rainfall, the presidency, therefore, can be divided into the following tracts : (1) the Konkan districts and a narrow strip of 15 to 20 miles on the crest of the Western Ghats, which receive more than 80 inches and where the rainfall is both heavy and dependable; (2) a strip of 15 to 20 miles to the east of the above strip, in the Deccan and the Karnatak, which receives from 35 to 50 inches of rain but in which the fall and its proper distribution is by no means certain; (3) further to the east is a tract which, in good years, receives from 18 to 30 inches but which frequently falls below this and is consequently liable to famine; (4) Khandesh which receives from 20 to 30 inches, but where the rainfall is normally secure; and (5) Gujarat, which receives from 20 to 40 inches on an average, the amount tending to become smaller towards the north.

Gujarat has a brisk cold season and a hot oppressive summer. In the coastal tract, the temperature is equable but inland it ranges between 52° in the cold weather and 110° in the hot weather.

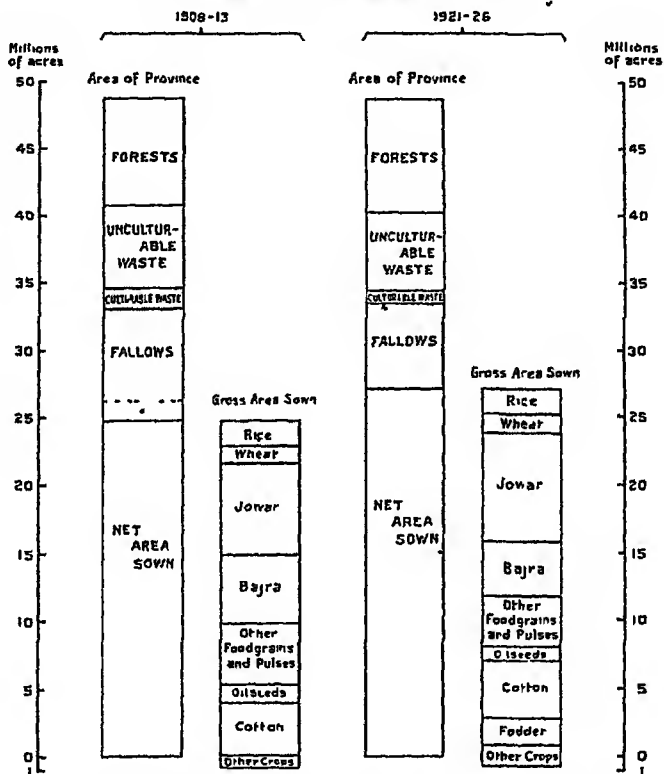
In the Konkan tract, the air is heavily charged with moisture throughout the year and the climate, except from December to February, is oppressive, though the thermometer seldom rises above 96°. Extremes are unknown as the climate is always tempered by sea breezes.

In the Deccan, during March and April, the thermometer reads from 100° to 110° but the air is dry and the heat less oppressive than on the coast. During the monsoon the climate is pleasant, and the cold months are bracing.

BOMBAY (PRESIDENCY PROPER)

CLASSIFICATION OF TOTAL AREA AND AREA UNDER VARIOUS CROPS (5 Year averages)

NOTE - The difference between the Gross Area Sown and the Net Area Sown represents the area sown more than once



* App assume area of Fodder Crops included in Fallows in 1915-16 areas under Grass and Babul previously shown as Fallow were included in the Area Sown under Fodder Crops, the area so treated in 1915-16 was about 1/2 million acres. The corresponding area for the years 1908-09 to 1912-13 is not known, but it has been assumed that it was about 1 1/2 million acres. Fodder Crops other than Grass and Babul averaging about 47,000 acres for the period 1908-13 are shown under other Crops.

In the Karnatak, the cold season is short. During the hot season the climate is tempered by westerly breezes from the sea and extremes of heat, except in the east of the division, are seldom reached. In the whole of the presidency, outside Sind, frost is very rare though not quite unknown.

The total number of villages in the presidency proper is 22,841. The relative importance of the chief crops of the Bombay Presidency including Sind is shown by the accompanying diagram. The columns show, for the periods 1908-13 and 1921-26, the proportion of the whole area which is cultivated; and they have been sub-divided into sections showing areas occupied by different crops.

The total cultivated area of the presidency proper is 33·5 million acres. Of this, the gross cropped area in 1926-27 was 28·5 millions, about half a million being cropped more than once. The uncultivated area, more than half of which is forests, is about 15·2 million acres. Of the cropped area, 19·5 million acres are under food crops and 8·5 millions under non-food crops. Amongst the former, *juar* 7·5 millions, *bajri* 4·5 millions, rice 2 millions, and wheat 1·3 millions are the most important. Sugarcane is grown on 66,000 acres. The most important non-food crop is cotton which is grown on 1·3 million acres. Oil-seeds account for 1·2 million acres.

A census of livestock is taken every five years. Recent figures for cattle are :

				Millions.
1909-10	..	..	..	7·5
1915-16	..	.	..	9
1919-20	..	.	..	8
1924-25	..	.		8·5

In the last census, there were over 3·3 million plough cattle, 2·8 million milch cattle and 2·8 million cattle for other purposes. The sharp fall in the number of cattle in 1919-20 was the result of the serious drought in 1918-19 and 1919-20. The rapidity of recovery in favourable seasons is shown by the figures of 1915-16 and 1924-25. There are at present 11 plough cattle and 9 milch cattle for every 100 acres cropped. The number of sheep and goats in 1924-25 was 1·8 millions and 2·8 millions respectively, while there were 126,000 horses in the presidency.

2. PROVINCIAL INCOME AND EXPENDITURE.

The development of agriculture and other rural activities being closely connected with the question of provincial finance, a Table is appended showing the provincial income and expenditure during each of the last five years.

GOVERNMENT

(Figures are in
Revenue and Expenditure charged to Revenue)

Receipt heads	1922-23	1923-24	1924-25	1925-26	1926-27	Expenditure heads	1922-23	1923-24	1924-25	1925-26	1926-27
<i>Revenue Receipts</i>						<i>Expenditure charged to Revenue</i>					
Principal Heads of Revenue—						Direct Demands on the Revenue—					
Land Revenue ..	550	509	517	541	467	Land Revenue ..	167	183	63	65	66
Licence ..	423	435	448	415	409	Forests ..	10	44	44	44	43
Stamps ..	176	180	178	170	168	Other heads ..	14	17	49	63	73
Forests ..	70	71	73	76	77	Capital outlay on Forests charged to Revenue ..	.	.	.	.	2
Registration ..	13	13	12	13	12	Irrigation—Revenue Account ..	73	71	92	95	85½
Other heads ..	0	0	0	10	10	Irrigation—Capital Account charged to Revenue ..	36	.	.	.	10
Irrigation ..	53	54	53	42	40	Debt Services ..	109	155	202	277	250
Interest on debt ..	80	103	133	160	168	Civil Administration—					
Civil Administration—						General Administration	117	163	223½	231	228
Administration of Justice ..	14	15	16	10	18	Administration of Justice ..	67	70	73	76	76
Jails and Convict Settlements ..	5	5	5	5	6	Jails and Convict Settlements ..	27	25	26	20	25
Police ..	8	6	5	8	8	Police ..	171	168	171	172	170
Education ..	10	10	11	11	11	Education ..	172	193	186	198	201
Medical ..	6	6	6	6	6	Medical ..	45	44	15	49	62
Public Health ..	5	8	6	6	6	Public Health ..	18	20	23	25	22
Agriculture (including Veterinary and Co-operation) ..	4	4	3	3	3	Agriculture (including Veterinary and Co-operation) ..	21	24	27	27	27
Other departments ..	1	2	2	3	2	Industries ..	3	2	..	1	1
Civil Works ..	16	18	15	10	16	Other departments ..	8	9	6	5	5
Miscellaneous ..	24	33	28	30	36	Civil Works ..	100	100½	95	96	126
Miscellaneous adjustments between Central and Provincial Governments (net) ..	..	28	41	10	4	Miscellaneous ..	159	136	147	160	161
Extraordinary receipts ..	..	..	..	..	3	Contributions to the Central Government..	50	50	50	34	28
Total, Revenue Receipts.	1473	1509	1556	1559	1480	Total, Expenditure charged to Revenue ..	1400	1479½	1522½	1649	1651½

OF BOMBAY

lakhs of rupees)

Capital Receipts and Expenditure

Receipt heads	1922-23	1923-24	1924-25	1925-26	1926-27	Expenditure heads	1922-23	1923-24	1924-25	1925-26	1926-27
<i>Capital Receipts</i>						<i>Capital Expenditure</i>					
Revenue Surplus ..	64	20½	26½	..	..	Revenue Deficit ..	..	..	..	91	165½
Bombay Development Scheme ..	28	23½	24	28	25½	Capital outlay on Forests ..	2	4	1	..	..
Loans from Central Government ..	767	1025	704½	..	..	Construction of Irrigation, etc., works ..	69½	70	150	246	207
Famine Insurance Fund ..	61	33	50	31	47	Capital outlay on Improvement of Public Health ..	6	1	..	12½	8
Sinking Funds ..	10	11	11	12	12½	Capital outlay on Agricultural Improvements ..	..	1	..	..	..
Loans and Advances by Provincial Government ..	66	63	37	87	87	Bombay Development Scheme ..	265½	248	168	77	46
Advances from Provincial Loans Fund ..	..	..	..	638	262	Civil Works ..	45	66	85	78	87
Other Capital Receipts ..	..	..	4	0	7½	Other Works not charged to Revenue ..	18	2	1	..	10
						Payment of commuted value of Pensions ..	..	..	..	..	4
						Loans from Central Government (repaid) ..	20	20	20	..	..
						Sinking Funds ..	10	11	11	12	7½
						Loans and Advances by Provincial Government ..	350	610	370	168	93
						Advances from Provincial Loans Fund (repaid) ..	..	..	..	76	70½
Total, Capital Receipts ..	1021	1100	857	816	437½	Total, Capital Expenditure ..	804	1042	771	770	647½
Opening Balance ..	214	431	582	66½	73½	Closing Balance ..	434	582	66½	784	624

The finances of the presidency are not in a prosperous condition. A considerable effort at retrenchment was made in 1922, but owing to the expansion of various activities, an increase in expenditure became inevitable, and was met by increased taxation. Since 1922, Government has increased its famine fund from practically *nil* to nearly Rs. 2 crores

and its balances from Rs. 2 crores to about Rs. 3·5 crores. The expenditure in 1926-27 shows an increase of 123 lakhs over the actuals of 1924-25. This figure indicates the expansion of the demands of the administrative departments, especially on the transferred side of Government.

On the income side, land revenue is responsible for 34 per cent, excise comes next with 28 per cent, followed by stamps 12 per cent. Forests bring in a revenue of about 5 per cent, while the other sources of income contribute only 21 per cent. The land revenue system is described in another section. Any increase under this head can only follow increases sanctioned at revision settlements. There has been a strong opposition in the Legislative Council in recent years to any increase, in spite of an appreciable rise in prices. In the case of excise, the increase in revenue has been due not to any increase in consumption—which on the contrary has fallen very greatly—but to an increase in taxation. The policy of the Government has been to reduce consumption, first by increasing the cost to the consumer, and secondly by rationing. The latter course will bring about a considerable reduction in the revenue under this head.

The new taxes levied during the last few years were a tax on entertainments and a totalisator tax. Stamp duties and court fees have also been increased.

On the expenditure side, next to debt services and general administration, education comes first and expenditure on it has risen to over Rs. 2 crores or twelve per cent of the total expenditure. The amounts spent on agriculture, public health and medical are two per cent, one-and-a-half per cent and three per cent, respectively.

3. REVENUE ADMINISTRATION AND LAND RECORDS.

The Governor is assisted by four Members of the Executive Council who deal with law and order, finance, irrigation, land revenue and famine relief: and by three Ministers who deal with agriculture, co-operation, veterinary services, local self-government, public health, education, excise and forests.

The revenue administration of the presidency is carried on by four Commissioners, under whom are Collectors, one for each district. One Commissioner is in charge of Sind, the other three are in charge of the Northern, Central and Southern divisions. The collectorate generally comprises ten talukas each consisting of 100 to 200 villages. The village in some respects still retains traces of the old system of village government by the rural community. Each village has its regular complement of officers, some of whom are hereditary. The principal village officer is the *patel* who is the headman of the village for revenue and police purposes. The *kulkarni* or *talati* is the village accountant, the *mahar* is the messenger and there is also the watchman. The *patel* and *kulkarni* usually hold a certain area of land rent-free and are in addition

remunerated by cash payment. The *muhar* and the watchman also hold land on favourable terms and receive, in addition, grain and other payments in kind from the villagers. The village is for government and for social purposes generally self-contained. Each taluka is in charge of an officer called the *mamlatdar*. He looks after the revenue administration of the taluka and treasury and is ordinarily also a magistrate. Over the *mamlatdar* comes the assistant or the deputy collector with a sub-division consisting of three or four talukas. For seven months in the year he is on tour to inspect the revenue work and ascertain the needs of the villagers. The Collector is the revenue head of the district and also the district magistrate. The Revenue Commissioner exercises general superintendence and control over the revenue administration of a division of six or seven districts. It is his duty to advise Government on the major problems of administration and on the qualifications of officials under him.

The land revenue system of the presidency is known as *ryotwari*. Every plot of land is held from Government in perpetuity as a transferable heritable property on condition that the holder pays land revenue to Government as fixed at the settlement. The settlement is in force for a period of thirty years. At the conclusion of the period of settlement, the revenue payable is liable to revision, within certain fixed limits. An increase in the assessment is based on an increase in prices and is supported by such considerations as improvement in communications, increase in rents and prices of land. The enhancement, however, in the case of a whole taluka cannot exceed 33½ per cent over the previous settlement rate nor can it exceed 100 per cent in the case of an individual holding. Recently it has been decided to reduce the general limit to 25 per cent in the case of all talukas that have already undergone a second revision. Any improvement of land made by the landholder either at his own cost or from money borrowed from the Government is exempt from enhanced assessment.

The preparation of original survey settlements began in 1835 and continued till 1901. The principles of the existing system were evolved some eighty years ago by Messrs. Wingate and Goldsmid. Each piece of land was measured and classified and its relative productive capacity was assessed with accuracy. The comparative valuations of the fertility of soils were expressed as parts of a rupee, sixteen annas representing a perfect field, from which deductions were made for disadvantages such as slope, excess of lime or moisture, inferiority in character or depth of the soil. After the relative valuation in fertility of the soil of every field had been completed, the villages were divided into groups, each consisting of villages judged to have equal climatic and economic advantages. Then the rate of assessment of the 16 anna land in each group was determined as the maximum rate; and all other

land was assessed on a comparative basis, the rates fixed to be paid annually after harvest or in two instalments.

Two important improvements which have been introduced in recent years in the revenue system are the record of rights, and rules for the suspension and remission of land revenue. The record of rights was prepared from 1904 onwards. It is based on possession and shows in detail all rights in each piece of land. It also shows the tenure of the land and all encumbrances thereon. When crops fall below a certain standard owing to drought or the failure of the water supply in irrigated land, provision is made by rules for the grant of suspensions or remissions of land revenue. The Collector ascertains by local enquiries that there has been a partial or total failure of crops and suspends the collection of land revenue accordingly.

4. THE CULTIVATOR.

Out of the total population of 16 millions in the presidency proper in 1921, 7·7 millions were landholders and tenants, 2·3 millions agricultural labourers, while the non-agricultural population was about 6 millions. Compared with 1911 this shows an increase in the rural population of Gujarat and Khandesh, a decline in other parts of the presidency, and a diminution in the number of agricultural labourers generally who declined from about 3 millions in 1911 to 2·3 millions in 1921, a decline partly due to migration to urban areas, and partly to transfer to the rank of landholder.

As regards the cultivators in the different parts of the presidency, there are great differences in economic condition and mental and moral development. There is the cultivator of Gujarat who is as efficient as any in the world and the hard-working and patient cultivator of the Deccan ; and there is the backward and lazy member of the wild hill tribes who has recently turned agriculturist and secures only the minimum outturn from his land. The people mostly live in villages containing from 100 to 1,000 houses. It is only in the Konkan that cultivators have homesteads on their own lands. The village site is usually provided with a *chavdi* where the village officers hold their office, and which is also a common meeting place of the inhabitants. The water supply in villages not situated on a river comes usually from a common well, or, in some places, from the village tank. As regards sanitation, while the people are personally clean, there is no communal effort and the surroundings of their houses are often dirty. Their diet, except in the rice growing tract, consists mainly of *juar* or *bajri*. Wheat is consumed only by the more prosperous classes, while in the hill tracts inferior millets are the staple food.

The province being almost entirely *ryotwari*, the average holding is small and often there is a dense population on the land. The following Table shows the size and distribution of holdings in each

division, together with the land assessment for the holdings per acre in 1922-23 :

Details	Gujarat	Deccan	Karnatak	Konkan	Total, Presidency Proper
	No.	No.	No.	No.	No.
Number of holdings—					
1. Under and up to 5 acres ..	273,683	358,754	150,005	195,844	978,680
2. Over 5 and up to 2½ acres ..	124,654	423,032	100,623	61,429	800,638
3. 25 to 100 acres ..	18,224	140,880	50,018	14,863	224,885
4. 100 to 500 acres ..	1,544	12,005	4,927	2,405	21,841
5. Over 500 acres ..	130	435	106	141	901
Total ..	418,235	938,006	406,568	273,742	2,035,451
Total area in acres ..	3,063,825	14,828,255	6,850,176	2,293,174	28,535,401
Average—					
Area of holding in acres ..	7.3	15.8	15.6	8.3	14.0
Assessment per holding Rs.	10 0 0	13 12 5	12 0 1	12 8 6	13 14 1
Assessment per acre Rs.	2 3 10	0 13 11	0 12 0	1 0 10	0 15 11

These figures show how small are the holdings, but it is impossible to compare one district with another as the land varies so much in fertility that a small holding in Gujarat may be equal to a much larger one in Konkan or the Deccan. In the presidency proper, there are only 22,742 holdings of more than 100 acres, or a proportion of 1.1 per cent of the whole. The units of cultivation may be far smaller, being often scattered in different parts of a village. The fragmentation thus caused acts as a severe handicap to proper cultivation, as in the Konkan, for instance, where there are fragments of less than 1/40th of an acre and even as low as 1/160th of an acre. So far, very few attempts at voluntary consolidation have been made as the work presents special difficulties, especially in areas where the quality and depth of soil vary greatly.

An attempt is being made to tackle the problem by means of legislation and a Bill has recently been introduced in the Bombay Legislative Council for the purpose.

The greater part of the Bombay Presidency bears one crop, *kharif* or *rahi*, the first from June to November, the second from September to March. During the remaining months the inhabitants of the villages, except in the irrigated tracts, have a considerable amount of spare time. During this time, carting is done, and some home industries such as spinning and weaving are carried on; in some places, there are small local industries such as sugar making from palms, cane preparation, lacquer work and rope making. Muhammadans and the depressed classes keep poultry but caste Hindus regard fowls as unclean animals. Cattle breeding is common in all parts of the province; and sheep and goats are the care of special castes. These occupations, however, do not occupy the whole leisure time available, nor do they supply an adequate income.

The position of labourers has improved considerably in recent years. The standard of living is reported to have risen in all parts of the presidency and to be higher now than at any previous date. The daily

wages of field labourers in rural areas increased from As. 2-3 in 1900 to As. 4 in 1913 and to As. 7-6 in 1927. In the case of other labourers, the corresponding figures are As. 2-6, As. 4-6 and As. 10-3. In urban areas similar wages have risen from As. 3-6 in 1900 to As. 5-9 in 1913 and to As. 10-3 in 1927. Compared with a decade ago, the working day in agriculture has been shortened. The hours now are from 7 a.m. to 11-30 a.m. and from 2 p.m. to 5-30 p.m. For casual labour the number of hours are $9\frac{1}{2}$ to 10. The direct influence of industrial centres, such as Bombay, on rural areas has been to shorten hours and to tempt the labourer away from rural employment. The chief industrial cities are Bombay, Ahmedabad and Sholapur and in these cities the cotton mills alone employ a force of 230,000 mill hands. The indirect effect has been through the concentration of capital in the towns and the loss of it to the country-side. Industrial concerns, banks, etc., have provided an alternative investment to land and moneylending. Commercial activities connected with the flourishing export and import trade of Bombay city similarly engage surplus capital and employ labour on a large scale.

Much employment has been provided in recent years by the State in the extension and duplication of railways, and the extension and improvement of roads, and by municipal bodies in town planning schemes.

Special mention should be made of the Marathas of the Deccan and Konkan. They number three millions, and retain the martial qualities which were famous on land and sea in the seventeenth and eighteenth centuries. They maintained that reputation in the great war.

The cultivator may be said to be as conservative as in other parts of the world. He cannot afford to take risks, but, when satisfied of the value of a new crop or implement, he does not hesitate to adopt it, as may be seen from the spread of groundnut and the introduction of the iron plough. The burden of debt lies heavy upon him; much of it has been incurred for unproductive purposes, such as marriages, funerals and pilgrimages. There is ground for hope that co-operative societies may lead to the redemption of debt and to the discouragement of unproductive borrowing.

5. THE AGRICULTURAL DEPARTMENT.

In 1802, the Government of Bombay imported cotton seed "reputed to be of a superior description" for cultivation in territories then held by Maratha Rulers. In 1830, the Agri-Horticultural Society of Western India was formed at Poona. In 1878, classes for agricultural education were started in the Poona Civil Engineering College. The Department of Agriculture was established in 1883. At first, the duties of the department were mainly statistical; to compile and maintain an analytical study of each district in order to ascertain its need for protection against famine; also to prepare agricultural statistics and maintain a record which was likely to be useful for revenue settlements. Experimental work was undertaken at farms started in Khandesh, Sind, Gujarat and Poona. An experimental farm was also attached in 1888 to the

Poona Engineering College. When the late Dr. Mollison joined the service in 1890, the operations of the department expanded with the opening of farms at Surat and at Manjri and a cattle breeding farm in north Gujarat for the preservation and improvement of the Kankrej breed of cattle.

In 1901, the Department of Land Records was separated from the Department of Agriculture and the Director was enabled to devote more time to the direction of research, propaganda, and demonstration. In 1907, came the establishment of the Agricultural College as a separate college in Poona. The college had then a staff consisting of a professor of agriculture, an economic botanist and an agricultural chemist. These officers were also in charge of research work and experiments. There has been a steady expansion of the department in the last twenty years. In 1907-08 its budget was Rs. 4.5 lakhs, in 1915-16 it rose to Rs. 8.5 lakhs and is now about 17 lakhs. The principal officers at present are: the Director, six deputy directors of agriculture, one for each division, an economic botanist, agricultural chemist, professor of agriculture, horticulturist, plant pathologist, agricultural engineer, livestock expert, and soil physicist. A recent addition has been that of a professor of agricultural economics.

The work of the department may be considered under the heads of—

- (a) Research and investigation.
- (b) Demonstration and propaganda.
- (c) Agricultural education.
- (d) Cattle breeding and dairying.
- (e) Agricultural statistics.

(a) *Research and Investigation.*

The progress made in the matter of research is to be measured both by the results achieved and by the improvement in the methods used. The latter have become more scientific, and purely empirical experiment is falling more into the background. The organisation of the work has also been transformed in recent years. Research work in recent years has been along the line of giving the worker as much liberty as possible under the control of a committee which is usually under the chairmanship of the Director of Agriculture, and is composed of men who have special knowledge of the work in hand. The men recruited for research work are usually chosen from the graduates of the Poona Agricultural College and are at first placed under a competent research officer to gain experience.

The most important research work done is that on cotton. Hybridisation has produced several new and improved types on the farms, and the seed has been distributed over large areas. The introduction of the new type 1027A in southern Gujarat has been estimated by a commercial authority to have added not less than Rs. 30 lakhs annually to the value of the crop in the tract. Good results have also followed from selection of such varieties as Dharwar No. 1, and Gadag No. 1 in the Southern Maratha country. In Khandesh, a high yielding type (N. R.) has been popularised and now covers very large areas. So also new varieties of

groundnut, the Japanese and Spanish pea-nut, have been widely introduced. Between 1912-13 and 1926-27, the area under this crop in Khandesh and in Gujarat has increased from about 5,000 to nearly 312,000 acres. This crop which is worth Rs. 80 to Rs. 100 per acre has replaced millets which only fetch half that sum. As regards wheat, Pusa varieties have been introduced in some of the districts of Gujarat. A new variety of rice has been distributed very recently and gives an increased yield of nearly twenty per cent. Some good work has also been done on tobacco and sugarcane.

Further research is in progress on the evolution of new types of cotton and on the improvement of existing types, on the study of cotton wilt, on the improvement of potato and *bajri* crops and of grass-lands. It is hoped that the pure types of rice and *juar* now being distributed will yield fifteen to twenty per cent more grain than was obtained before.

Success has also been achieved in the introduction of certain kinds of improved implements and in checking some plant pests. The iron plough and iron sugar mills are now widely adopted in the Deccan. The enterprise of Messrs. Kirloskar Brothers, who have established in Satara a very valuable pioneer factory for the manufacture of implements, has greatly assisted the spread of the iron plough and the sugar mills in the Deccan. In regard to plant diseases, mention may be made of the increasing use of copper sulphate as a preventive of smut in *juar* and of Bordeaux mixture for grapes and betelnut. Reference may also be made to the use of concentrated manures for garden crops and of castor cake for cotton. In Gujarat, ridge cultivation has been introduced for cotton and *juar* and has consistently given an improvement of twenty to twenty-five per cent in yield.

Investigations are also being carried out on methods of tillage. Dry cultivation, particularly in the tracts in the Deccan which are liable to drought, is one of the most important problems for the department. The soil experts are seeking to find methods for the preservation of soil moisture, and experiments in green manuring are in progress. Work is also being done on the discovery and development of suitable fruit crops. The work of the department has been assisted by a grant from the Indian Central Cotton Committee who have provided Rs. 65,000 a year for five years, for the investigation of the cotton boll worm in Gujarat and for wilt diseases of cotton. In 1911, in commemoration of the visit of His Majesty the King Emperor to India, a private donor, the late Sir Sassoon David, established a trust with an endowment of £53,400 (Rs. 8,01,000) the interest on which is to be used chiefly in giving grants-in-aid of expenditure incurred in establishing vernacular agricultural schools, or in conducting experiments for the introduction of improved methods of agriculture or the devising of improved agricultural machinery.

There are now seventeen experimental and seed stations of which five are in Gujarat, two in Khandesh, five in the Deccan, two in the Karnatak and three in the Konkan.

(b) Demonstration and Propaganda.

In recent years, the Agricultural Department has been working in close touch with the Co-operative Department, with private individuals in many districts and with taluka development associations subsidised by Government. The staff employed on this work consists in each division of a deputy director of agriculture supervising district agricultural overseers of whom there are usually two to each district. A divisional board of agriculture has recently been created for each division. This is presided over by the deputy director of agriculture or the assistant registrar of co-operative societies, and has secured the services of non-official gentlemen interested in rural development. They advise the Director of Agriculture and the Registrar of Co-operative Societies on the application of the agricultural and co-operative policy and they control the propaganda work in their division. They distribute government grants for loans to agricultural societies and the discretionary grant for propaganda purposes. The number of these divisional boards is now six. The taluka development associations are a recent creation and date from 1922. They receive a subsidy from Government equal to the amount which they collect, subject to a maximum of Rs. 1,000 per annum; and some of them are reported to be making substantial progress. The close touch which has been established between the Agricultural and the Co-operative departments has resulted in the successful organisation of several co-operative societies for the purchase of agricultural requisites and for the sale of agricultural produce. In some areas arrangements have been made for the supply of implements on hire. Methods of co-operative sale have also been effective in the case of cotton and *gur*: and one taluka development association is reported to have made progress in introducing co-operative fodder storage. Seed farms for the distribution of improved seed have been established by the department itself. The uncertainty of finding water, when wells are sunk, has been a very serious difficulty for the cultivator and has caused the loss of considerable sums of money so invested. For several years the department has undertaken boring operations to ascertain the presence of supplies of water and also to deepen existing wells; and recently experiments have been made, with considerable success, with water-divining. The terracing of lands and the leading of hill streams on to these terraces is a special feature of cultivation in the Deccan and presents engineering problems of some complexity. A special staff has recently been engaged by Government to assist cultivators with the expert knowledge necessary to deal with these problems.

"Generally speaking," says the Director in his last report, "we can look round the presidency and see in most areas improvements worked out or introduced by the Agricultural Department in large scale use; a gradually increasing desire among the cultivators for fresh development and a very strong movement towards the organisation of local agricultural development by the people themselves in many areas."

(c) *Agricultural Education.*

Higher agricultural education was introduced in 1878 after a severe famine which attracted attention to the necessity of the improvement of agricultural methods and practice. A course was started at the Poona Civil Engineering College specially designed for men who were to occupy the position of revenue inspectors. The course was for two years and attracted the attendance of thirty students. But the class declined in numbers when the students found that this course was not a direct road to government employment. In 1880, a farm was started and practical instruction given. In 1885, the University of Bombay was moved to grant a degree in agriculture, but it was not till 1890 that the university decided to give a diploma. The men trained received no preferential treatment, except for appointments to minor posts. This was not encouraging, and numbers again declined, and no student obtained a diploma in agriculture between the years 1897 and 1901. In 1897, the standard of admission to the course was raised and Government agreed to recognise an agricultural diploma as equal to a degree of the university. In 1899, the university consented to establish a regular course leading to a degree in agriculture. The number of students gradually increased; in 1907, 11 received degrees and in 1925, 59. In 1907, a separate agricultural college was established. The course of study was laid down by the university, and under Dr. Nann the college attained a considerable reputation, and attracted students from countries so far distant as Burma, Ceylon and Persia.

The department maintains six vernacular agricultural schools, of which that at Leni, near Poona, was the first. These schools are definitely vocational and are meant for the sons of cultivators possessing not less than 30 acres of dry or 10 to 12 acres of irrigated land. Boys are admitted between the ages of 14 and 17 provided that their aim is to go back to private farming and not to take service. They are required to do a considerable amount of practical work on the fields. Education, board and lodging are free. Each boy costs Government about Rs. 260 per year, or Rs. 520 for the full course of two years.

In 1922, a new course was introduced on the Punjab model for agricultural education in the higher standards of primary vernacular schools, and provision was made for teaching both theoretical and practical agriculture, with instruction in village carpentry and iron work in addition to the ordinary school routine. Each class is in charge of a teacher who has received a year's special training at a training school maintained by the Agricultural Department. Forty-three such classes have now been opened and have proved successful.

There is a short practical one-year course in agriculture at the Poona Agricultural College which is attended every year by about twelve to twenty young men belonging to the land-owning classes. There are also short courses on some of the government farms, the most successful is one in sugarcane-growing at the Manjri farm. This class which is very popular lasts for three weeks.

(d) *Cattle breeding and Dairying.*

Bombay has many breeds of cattle, each suited to its own region of which the following eight have distinctive characteristics :—

Kankrej in Gujarat,
Malvi in Khandesh.
Krishna Valley in Belgaum,
Amrit Mahal in Dharwar,
Gir in Kathiawar,
Dongri in Thana and Nasik,
Khillari in the Deccan.

In Sind { Thar and Parkar for draught. and
Kachhi for milk.

In general, however, it may be said that the cattle are of mixed breed, poor milkers, and mature very late. Attempts at improvement have been made by Government since 1881 when bulls were distributed to each district in charge of the district local boards. In 1907 the Civil Veterinary Department distributed premium bulls to individual landholders. This system has proved useful. There are now 63 bulls so kept with a subsidy from Government, and the demand is rapidly increasing. Owing to the difficulty of finding good bulls, Government established farms for different breeds to produce their own bulls. These breeding farms were established for the Kankrej cattle at Chharodi and Surat, for Amrit Mahal cattle at Bankapur and for Sindhi cattle at Karachi. Government are also subsidising two *gowshalas* to produce pedigree Gir cattle. Some other *gowshalas* have also been recognised and are being conducted under Government advice. Some half a dozen cattle shows are held every year.

The chief difficulty in the improvement of cattle consists in the absence of castration as a general practice. The village herds wander on communal pastures and good cows are spoilt by wholly unfit bulls. The sanctity of the animal prevents the elimination of the unfit and large numbers are preserved which are of no economic value.

Attempts have been made to establish a dairying industry in the Kaira district of Gujarat. Butter and cream are transmitted to Bombay, a distance of 300 miles, but the industry has not yet proved a success on a large scale.

(e) *Agricultural Statistics*

These fall under three heads :—

- (1) land and its assessment,
- (2) agricultural resources, and
- (3) crops and tenancies.

The first is mainly fiscal. The second includes information for the quinquennial census of cattle and resources, and of the sources of water supply.

The third consists of the record of crops and tenancies, the abstract and forecasts of various crops, fortnightly statements of prices of principal agricultural products and weekly season reports. Most of the statistics are prepared in the first instance by village officers and then

checked by superior officers. They are fairly accurate for practical purposes.

6. THE VETERINARY DEPARTMENT.

In 1909, the Civil Veterinary Department, as at present constituted, was established. Before that date veterinary work dealt principally with horse breeding and was in charge of officers lent from the Military Veterinary Department. Horse breeding was then transferred to the Military Department and the Civil Department concentrated its operations on cattle. Veterinary hospitals and dispensaries are in charge of the district local boards, Government contribute towards their maintenance and bear the cost on account of the veterinary assistant surgeons in charge of them. Cattle breeding is now in charge of the Agricultural Department and under the control of their livestock expert, and the Veterinary Department confines itself to dealing with cattle diseases.

There are 103 veterinary dispensaries in the presidency proper, and some districts, in which the local boards are affluent, such as East and West Khairdesh, will shortly have one dispensary in each taluka. Poorer districts, such as those on the coast, have on the average only three dispensaries to a district. Progress in the matter of construction of new dispensaries has been accelerated since 1910 when the Trustees of the estate of the late Mr. N. M. Wadia, C.I.E., offered to place at the disposal of Government Rs. 15,000 a year for the construction of such buildings. Eighteen veterinary dispensaries have so far been built with the help of this donation, half the cost of construction being met from it and the remaining half from provincial and district local boards funds. So far, it appears that the dispensaries have not been largely resorted to by the rural population and have chiefly benefited the people living in towns and surrounding villages. Touring dispensaries are being started in certain districts.

The Glanders and Farcy Act is at present the only Act for the control of diseases of livestock. In regard to rinderpest, preventive inoculation has been fairly successful. But there are difficulties in securing timely reports and there are prejudices against inoculation. These are gradually being overcome. Proposals for legislation for isolation of animals, for restriction of their movement and for compulsory inoculation are now before Government. In 1926-27, it is reported that 360 villages were affected with rinderpest, 15,189 cases and 7,002 deaths being registered.

A veterinary college was established in Bombay in 1886 primarily to train men for employment by Government or local bodies. There are about ninety-one students on the rolls, and the course lasts for three years. Of the sixteen candidates who passed last year, nine entered government service, and seven obtained employment in Indian States.

The department consists now of two officers of the Indian Veterinary Service and seven of the Provincial Veterinary Service, and the expenditure is a little over Rs. 5 lakhs.

7. IRRIGATION.

Out of the total cropped area of 27·5 million acres, less than a million acres are irrigated; and of this irrigated area nearly two-thirds is in the

Deccan. The sources of irrigation are : (1) government canals irrigating 260,000 acres, (2) wells irrigating 500,000 acres, and (3) other sources, such as tanks and hill streams irrigating 200,000 acres.

Out of the total area of 260,000 acres irrigated from government canals, 230,000 are in the Deccan chiefly on works constructed for the protection of the country from famine. In the year 1874-75, the first attempt at the storage of the heavy monsoon rains was made and Lake Fife close to Poona was constructed to feed the Mutha canals. In 1884, the Nira Left Bank canals were constructed. After the report of the Irrigation Commission of 1903, a systematic survey was made, and several new projects were prepared and have since been carried out, such as the Godavari canals, the Pravara canals and the Nira Right Bank Canal. This last work is now nearing completion and the total then irrigated will exceed 400,000 acres. The economic conditions of the famine tract have been greatly improved thereby, and the people generally are not only more secure against famine but more prosperous in normal years. These works are important enough to deserve some detailed description.

(1) The Nira Left Bank Canal protects a part of the Poona district which receives precarious rainfall. Although designed as a protective work, it yields a net return of eight per cent on the irrigation of 83,000 acres.

(2) The Godavari canals irrigate a part of the Nasik district. They were completed in 1915-16 at a cost of a little over a crore of rupees. The area irrigated is 40,000 acres, of which 7,500 are under sugarcane. The villages in the canal tract are growing into busy towns.

(3) The Pravara canals were completed in 1926 at a cost of Rs. 1.5 crores. They irrigate 49,000 acres, of which 9,000 are under sugarcane.

(4) The Nira Right Bank Canal will be completed in 1931-32 and will irrigate 70,000 acres at a total cost of Rs. 4,91,00,000.

As the storage provided by the Lloyd Dam at Bhatgar for the Nira Right and Left Bank canals will not be sufficient for the full development of irrigation in the Nira Valley, a complete scheme which provides for the widening and remodelling of the Nira Left Bank Canal and for building a new dam at Vir to supplement the supply of the Bhatgar Dam has been sanctioned. The additional works will cost Rs. 135 lakhs.

The area irrigated from wells exceeds the area irrigated from government canals and other sources, and the cultivation thereon is of a very high order. The water is ordinarily drawn up by bullock power by means of big leather bags. In some places Persian wheels are found and oil engines are now being introduced, particularly in the Kaira district of Gujarat. In recent years there has been a lowering of the water level in wells, which has rendered the supply in some cases insufficient, and has everywhere increased the cost of irrigation.

Other natural sources of water supply have not yet been fully tapped. Opportunities are available for the construction of small tanks and masonry dams on hill-streams which might irrigate terraced cultivation and would supplement the supply from wells in the vicinity. Such works

already exist in the hilly tracts of the Deccan and in some parts of the Karnatak, and the scope for their extension is considerable. Government have recently appointed a special officer of the rank of superintending engineer to investigate the question of such minor irrigation works. This officer works under the Revenue Department and the work is financed from the famine fund. The results obtained have been encouraging.

The Irrigation Department also carries out some experimental and research work. Research problems are connected with waterlogging and salt efflorescence and the reclamation of such lands. Experiments are made in designing drainage channels to save land from waterlogging and in different methods of preventing leakage. Surveys have also been made with a view to distributing crops on soils best suited to them.

The importance of these canals to the cultivation of sugarcane may be appreciated from the fact that, in 1915-16, thirty per cent of the total area under sugarcane was irrigated by government canals but, in 1924-25, this area was sixty per cent of the total. This crop is also reciprocally valuable to the canals, for it pays a considerable proportion of their total revenue.

Mention may be also made here of three big hydro-electric works on the Western Ghats, established by the Tata Company. The power generated by these works is used almost entirely in urban areas for industrial and other purposes. There does not seem to be any immediate possibility of employing this power for the benefit of agriculture but the question of using the tail water of one of these works for purposes of irrigation is under consideration.

8. FORESTRY IN RELATION TO AGRICULTURE.

The area under forests is 15,000 square miles, or twelve per cent of the total area of the province. The distribution, however, is uneven: one district, Kanara, contains one-fifth of the total, Khandesh and Thana contain another one-fourth, while some of the districts in the Deccan and Gujarat have very small areas under forests. One-sixth of the area is in charge of the Revenue Department, the remainder being in that of the Forest Department. Large tracts are open for grazing and grass-cutting and are thus a valuable source for the supply of fodder. Complaints are sometimes heard about the closure of forests against grazing; but the area so closed seldom exceeds fifteen per cent of the total.

The Forest Department deals with all operations of technical forestry, but in matters concerning the rights and privileges of the people, the supply of grass, grazing, and fodder, the local revenue officers have a voice; and the Revenue Commissioner of the division exercises a general control.

The value of the Forest Department to the country is seldom fully recognised. While it has preserved forest growth for the use of future generations and has brought the forests under scientific regulation, it has eased the burden of the tax-payer by bringing in a net revenue of Rs. 30 to 40 lakhs.

The claims of agriculture have also been fully respected, and the cultivators in the neighbourhood of forests obtain their supplies of timber for

building, wood for agricultural implements, leaves for manure, fodder, grass, and grazing for cattle, at very low rates. The charge for grazing cattle in forests is a nominal fee of 2 to 4 annas per head per annum; and the total number of cattle admitted to graze in 1925-26 was about 2.5 million. In the principal forest district of Kanara, an experiment has been started of creating a minor forest department, to be in charge of forests which, though not growing valuable timber, are of special importance from the agricultural point of view. Experiments are also being made with a new system of closure of various areas for grazing so as to improve the quality and quantity of the grass; and some land has been handed over to the Agricultural Department to investigate the comparative effect of heavy or light grazing on the growth of grass.

Under the famine insurance scheme, forest grass has been stored in certain places, the reserves in Thana and the Panch Mahals amounting to 14,000 tons, and in West Khandesh to 8,000 tons. The grass is pressed and baled and is available for transport in times of scarcity to famine areas, the transport by rail being effected at special concession rates.

9. GENERAL EDUCATION.

In response to a growing popular demand due to the wider recognition of the need for the improvement and spread of education, the State and local bodies have enlarged the expenditure on the subject in recent years. As noted in section 2, State expenditure represents twelve per cent of the revenue. Between 1913-14 and 1926-27 the total expenditure on public instruction rose from Rs. 159 lakhs to Rs. 381.5 lakhs. Of this total, government funds contributed fifty-two per cent, municipal boards* eighteen and three-quarter per cent, fees seventeen and a quarter per cent, and other sources twelve per cent. Half the amount was spent on primary education. The State expenditure on education increased during this period from Rs. 73 lakhs to Rs. 198.6 lakhs.

The detailed figures of State expenditure for the year 1926-27 are given below :—

1926-27					
<i>Institutions</i>					
	Boys	Girls	Total	Percentage	
	Rs.	Rs.	Rs.	(Figures in lakhs)	
University	12.7	..	12.7	0.35	
Secondary	17.4	5.2	22.6	11.3	
Primary	105.2	16.5	121.7	60.85	
Special	10.6	1.0	12.5	6.25	
Buildings	7.1	0.3	7.4	3.7	
Miscellaneous, including scholarships	7.2	1.1	8.3	4.15	
Total	100.2	25.0	125.2	92.00	
Direction and inspection	12.1	0.7	12.8	6.4	
Exchange and expenditure in England .. ..	..	..	2.0	1.0	
Grand Total .. ..	..	..	200.0	100.0	

* Includes District Boards.

If we take the figures for the whole of India for 1924-25 the last year on record, we find that the expenditure per head for India was Rs. 21, while in Bombay it was Rs. 35. The percentage of scholars to population was 3.96 for India and 5.28 for Bombay. In the year 1926-27 the total number of pupils under instruction in Bombay was 1.15 million. The percentage of male scholars under instruction to the total male population was 9.12, the corresponding figure for girls being 2.43. The percentage of attendance varies very greatly according to the keenness for education in different communities. It is reported from the Deccan, for instance, that the Brahmin community send 100 per cent of their boys to school. The higher scale of expenditure in this presidency compared with the rest of India is in part due to the larger provision of trained teachers and to the higher salaries paid to them. Sixty per cent of the teachers had passed through a training institution; thirty-six per cent had passed a qualification standard; and less than four per cent were without qualification.

The primary schools are subject to the same criticism as elsewhere in India that they serve largely as a crèche for infants. Out of the 9.3 lakhs of pupils, thirty-one per cent are in the infant class and only twelve per cent reach the fourth standard. Thus much of the money spent is wasted and is not effective in raising the standard of literacy. There is considerable popular support for the view that compulsion is necessary to secure the attendance of pupils until a stage when they may be regarded as literate. In 1923, Bombay passed a Primary Education Act under which compulsion could be introduced both in urban and in rural areas. This Act enabled municipal and district local boards to introduce compulsion. But so far, few of these bodies have taken advantage of this power. The areas in which it has been introduced are the following:—the municipal areas of Surat, Bandra, Dhulia, Byadgi, Satara, Ahmednagar, Sholapur and Bioach. It has not yet been applied to any rural area.

The delay has been due partly to the need for a revision of the District Local Boards Act in which considerable changes were found necessary owing to the proposed transfer of the management of the primary schools to local bodies: the Act was revised in 1925 in the light of the Primary Education Act of 1923, and opportunity was also taken to broaden the basis of representation for the rural classes on the local bodies. Twenty-two out of the twenty-seven district local boards in the presidency have now taken over control of primary education.

On an average, there is one boys' primary school for an area of 10.3 square miles and the male population under instruction in primary schools is 6.8 per cent. Out of the total expenditure of 198½ lakhs on primary education, 62 per cent was found by Government, 28 per cent by local boards, 2.5 per cent by fees and about 7.5 per cent from other sources.

An attempt was made some years ago to separate the urban primary course from the rural. But this did not prove popular, since pupils taking the rural course were not able to pass into the English middle school; and

this distinction was therefore removed. An alternative syllabus for the vernacular final examination has now been introduced in order to adapt the education to the needs of the children of agriculturists. This experiment gives every promise of success.

Attempts have been made to introduce education for adults, and funds for this experiment were supplied by a private donor, the late Sir Vithaldas Thackersey. On the death of the donor, the experiment was discontinued.

To encourage education amongst the backward classes, a system of scholarships has been established, and in some cases special communal institutions have been founded. These backward classes number 3·7 millions and represent nineteen-and-a-half per cent of the total population; and the percentage of literacy amongst them is very small. The problem is, therefore, very urgent and is engaging the earnest consideration of Government.

In order to arouse public interest in rural areas on subjects connected with village welfare, such as education, agriculture, co-operation, and public health, magic lantern lectures have been recently instituted. These usually attract big crowds and have proved valuable in spreading useful information amongst a section of the populace which cannot be reached by printed matter.

10. CO-OPERATION.

The problems of providing finance for agricultural operations have been long examined and debated. The dependence of the cultivator on the village moneylender has led to much tyranny and oppression, and the cultivator has been handicapped by his illiteracy and his inability to understand accounts. In the 'seventies', this oppression led to agrarian riots and, in 1879, the Deccan Agriculturists' Relief Act was passed, which was subsequently extended to other parts of the presidency. This Act enabled the civil courts to examine the whole relation between a creditor and a debtor and to investigate the conditions in which the bonds were passed. The rapidly rising value of land was held to afford too facile credit to cultivators who were thereby encouraged to raise money for unproductive purposes without being able to understand the meaning of the engagements into which they entered. Attempts were, therefore, made to restrict their credit but with partial success in improving their condition. In 1883-81, all-India Acts were introduced to provide State loans of short-term credit for the purchase of seed and cattle and of long-term credit for the improvement of lands by the construction of wells and embankments. In 1901, the Co-operative Credit Societies Act was passed. This was restricted at first to the provision of credit. It was revised in 1912 so as to admit forms of co-operation other than credit and was replaced in 1925 by the Bombay Co-operative Societies Act. The Agricultural and Co-operative departments are concerned with the improvement of the economic condition of the ryot, and have worked together in close and intimate connection. Until 1920, the Registrar of

Co-operative Societies was subordinate to the Director of Agriculture, but since then he has held an independent post, and sits on a joint board with the Director of Agriculture.

From the first, the co-operative society enlisted the sympathy and help of private individuals with influence in rural areas, who, from a sense of public duty, help the department in the work of propaganda and organisation. The education of the agricultural classes in the co-operative idea and its economic and moral lessons was uphill work and made slow progress in the beginning. A great impetus to the credit movement was given by the establishment of the Bombay Central Co-operative Bank, now known as the Provincial Co-operative Bank. This was the first bank of the kind on the debentures of which Government guarantee the interest. This bank, like all other co-operative banks subsequently started, may lend money only to societies registered under the Co-operative Societies Act.

The progress made has been very rapid. The number of societies in 1910-11 was 256 with a membership of 20,000, the number in 1926-27 was 5,091 with a membership of 482,000. The working capital has also increased during these years from Rs. 14 lakhs to Rs. 10·3 crores. Of these societies, 4,286 societies are agricultural primary societies with a membership of 3 lakhs and a working capital of Rs. 3·8 crores.

The organisation in Bombay has a threefold division. There is first the government department under the Registrar which is responsible for the registration and cancellation of societies, their audit and liquidation, their general control in their relation to the State and their maintenance within the provisions of the law. In addition to the Registrar, the staff employed for this purpose consists of 7 assistant registrars, 41 auditors, and 10 organisers. The organisers are concerned mainly with the organisation and supervision of non-credit societies. The work of the auditors consists chiefly in auditing the accounts of the societies once a year. The general supervision is in the hands of the assistant registrars. The policy has always been to allow the societies to manage their own affairs and to reduce interference from outside to the minimum possible.

Secondly, there is a network of central banks with the Bombay Provincial Co-operative Bank at the head. This organisation deals with finance of societies. There is, thirdly, the Bombay Central Co-operative Institute with its branches, which undertakes propaganda, instruction and supervision on the moral and educative side. While the influence of the institute is growing, the Registrar and his staff also take their part in the work. The aim is to make the institute the central federal organisation of co-operative societies, representative of them and controlled by their delegates. Constitution of the institute has been revised and made more democratic. It has now a network of district branches. The institute holds conferences and training classes in English and in the vernaculars. The institute is helped both by the department and by the central financing agencies.

The most important unit in the organisation is the member of the individual primary society. The village co-operative credit society is formed on the basis of unlimited liability without shares. There is usually one society to a village. The capital of the society is raised by means of local deposits supplemented by loans from the district or from the Provincial Bank.

Credit still plays a chief part in the movement, but there has been some considerable development also on the non-credit side. The distribution of seed is mainly done through existing credit societies, and in some cases through sale societies. Societies for the hiring of machinery have been successfully started, dealing chiefly with ploughs and sugarcane crushers. Two power pump societies have been established to irrigate lands belonging to the members and two ginning societies have been registered, one of which has worked well for the last two years. Sale societies, dealing chiefly in cotton and *gur*, sold goods last year to the value of over Rs. 72 lakhs. In one case, opposition was encountered from local middlemen but was successfully overcome. Individual members of credit societies also made use of the Bombay Provincial Co-operative Bank for the sale of cotton and *gur*.

Another development has been the formation of fencing societies which construct walls to protect lands from the ravages of pigs and other animals. There are eleven such societies. It is anticipated in many cases that the protection thus afforded will pay for the cost of the walls in a year or two. There are eighteen societies for the breeding of cattle, fifteen of which are found in the Southern division where they are working well.

Much help has been derived from taluka development associations referred to in section 5. In all measures undertaken by private enterprise Government has afforded encouragement through the assistance given to the divisional boards, taluka associations, and a liberal grant to the Central Co-operative Institute. The central banks command the confidence of the public and are able to raise considerable sums.

A very important proposal which was recently before Government is the organisation of land mortgage banks. At present, long-term capital is supplied partly through the proceeds of debentures issued by the Provincial Bank and partly through the amounts placed at the disposal of the movement by Government out of its *taccari* grant. If, however, the relief of indebtedness is to be undertaken on any appreciable scale, much larger amounts will be required. It is proposed that, in order to facilitate the formation of such banks, debentures should be issued and the interest thereon should be guaranteed by Government. It has been decided to start, as an experimental measure, two land mortgage banks, one in Gujarat and the other in the Karnatak.

11. COMMUNICATIONS AND MARKETING.

The presidency is served by three railways, namely the Great Indian Peninsula, the Bombay Baroda and Central India, and the Madras and Southern Mahratta. The first two are on the broad gauge and the last

is a metre gauge line. The Great Indian Peninsula connects Bombay with Calcutta and Madras, the Bombay Baroda and Central India with Delhi, while the Madras and the Southern Mahratta runs to Mysore. There are also branch lines in different parts of the presidency. The total mileage of railways at present serving the presidency proper, excluding the States of Western India, is 2935. On the coast, communications are maintained by steamship lines which sail at regular intervals from Bombay to Karachi and the Persian Gulf in the north and to the ports of the Kolaba and Ratnagiri districts and on to Goa and Mangalore in the south.

The present mileage of metalled roads is 8836. The principal roads in charge of the Public Works Department in the Central and Southern divisions are in very good condition. In Gujarat, partly owing to the fact that the country is interspersed with rivers and partly owing to the difficulty of getting metal, the condition of the roads is bad. Roads in charge of district local boards are not usually well maintained as the boards have not sufficient funds at their disposal.

In recent years, large sums have been expended on the provision of bridges and the improvement of low level crossings of rivers and streams. But off the main roads a great deal remains to be done in providing access to remote villages. The chief means of transport from the field to the market place or the railway station is the bullock cart. The motor bus has recently come in and is popular wherever the roads permit of its use. The motor lorry for transport is still in the future. The bullock cart has supplanted the pack animal which was the chief means of conveyance sixty years ago. Many types of cart are used, and some are capable of improvement both for the sake of the animals and to save the wear and tear of the roads. With better transport there will be encouragement for growing fruit and vegetables of a perishable character which cannot now be marketed quickly enough. In 1926, a Road Board consisting of officials and non-officials was appointed by Government. This Board is to advise Government on the classification of the roads and lay down standards to which each class of road is to conform. When funds are available for the construction of new roads, the Board will advise Government as to the allocation.

The greater part of the agricultural produce is dealt with in local centres for local consumption. Crops for export represent a small percentage of the total. The market of the export crops is highly organised, particularly in the case of cotton. Grading for sale on any large scale is unknown, except in the case of cotton and *gur*. In regard to cotton, government officers assist the grading done by cotton sale societies in the Karnatak and in regard to *gur* the Provincial Co-operative Bank supplies experienced valuers.

The small cultivator sells his produce either to the village *bania*, who is usually both a moneylender and a trader, or to an itinerant purchaser who comes to the village at harvest time; or he may take his produce to the nearest market and sell it through an *adaiya* (broker). The broker finds a purchaser for the produce and fixes the price for the cultivator.

The cultivator is generally at a disadvantage and is unable to dispute the price fixed for him by the broker.

In addition to the difficulty of communications, the cultivator is handicapped by the high rates of transport by rail and by the multiplicity of weights and measures which are sometimes manipulated to his disadvantage.

12. LOCAL SELF-GOVERNMENT.

The present system of local self-government dates from the year 1881 when an Act was passed to promote interest amongst the people in local matters and to give them a voice in the disposal of local funds. Under this Act, each district was to have a district local board and each taluka a taluka local board, the latter board being subordinate to the former. The proportion of elected to non-elected members was two-thirds and one-third respectively. By a recent Act, the constitution and powers of local boards have been revised, and the proportion of elected members has been increased to three-fourths. The franchise has been widened and women can now be elected members. Additional sanitary and other powers and wider powers of taxation have also been granted. Presidents and vice-presidents are now non-officials elected by their respective boards. The policy during the last decade has been to give more power and responsibility to the local boards and, where control is still exercised by the State, it is used solely for the purpose of safeguarding the interests of tax-payers, especially in cases where State funds have been lent. The funds at the disposal of the boards consist chiefly of the local fund cess on land revenue, other sources of revenue being receipts of ferries, tolls on local board roads, quarrying fees, etc. The boards also have power to levy, with the sanction of the Commissioner, such local taxes as the local authority is authorised to impose under Section 80A of the Government of India Act. In addition, considerable grants are made by Government for education, roads, water supply, village sanitation and maintenance of dispensaries. The management of schools is now almost entirely handed over to these bodies.

Every district in the presidency has a district board. There are 27 such boards and 220 taluka boards. The total income of the boards is over two crores. The incidence of taxation varies from district to district, the maximum being in Bronch, 12 annas 3 pies, the minimum in Ratnagiri, 10 pies. In 1925-26, the aggregate expenditure of the boards chargeable to current revenues was Rs. 173 lakhs. The main heads of expenditure were administration, education, medical relief, and public works. The boards spent Rs. 85 lakhs on education, Rs. 7½ lakhs on medical relief, and Rs. 40 lakhs on public works. The government contributions to the expenditure under these heads were Rs. 75 lakhs, Rs. 1½ lakhs, and Rs. 19 lakhs respectively.

On the review of the administration of local boards for 1924-25, Government remarked: "The working of the boards was, on the whole, fairly satisfactory. The chairman and members have evinced greater interest and energy in their work. Generally, the boards were opposed to additional

taxation and are prone to depend upon Government for increased grants from provincial revenues for works and objects of purely local importance. This resulted in inadequate attention to medical needs and to neglect of roads, etc. The principal question which the boards have to face courageously and to solve is one of finance."

Besides these local boards, there used to be, in some of the bigger villages, committees known as sanitary committees and for certain groups of villages, boards known as sanitary boards. These were formed under the Village Sanitation Act and had the power to raise a small cess for sanitary purposes. Most of these committees and boards have now been superseded by *panchayats* formed under the Village Panchayat Act, a recent enactment. *Panchayats* have been formed in other villages as well but their number is small and they have not as yet proved a great success, the chief obstacle in their way being their unwillingness to raise money by taxation.

13. PUBLIC HEALTH AND SANITATION.

The Department of Public Health is controlled by a Director assisted by five officers. It also runs the Vaccine Institute at Belgaum and certain public health laboratories. The chief duties vested in the department are the supervision of the sanitary conditions of the people and the recording of health statistics, reporting on the prevalence and prevention of disease, advising local authorities as well as Government on schemes and questions relating to sanitation and suggesting precautionary measures against epidemics in general.

The department is handicapped for want of an adequate staff. Much of its work is done in urban or semi-urban areas. The prevention of epidemics such as the cholera epidemic which used to be a common feature at fairs in former times is a notable example of the success achieved by the department. Health conditions in the villages are not very satisfactory. As the Director of Public Health remarks in his annual report, "the extent to which sanitation or the lack of it affects the material prosperity of the rural population must be considerable though it cannot be accurately estimated in the absence of statistics showing the number of persons incapacitated by sickness day by day throughout the year." Although the health of the rural population of the presidency may be said to compare favourably with that of other provinces, there can be no two opinions as to the urgent necessity for improvement. The death rate for the rural areas is about 25 per 1,000 as compared with 11.6 recorded in England and Wales in 1923.

Medical dispensaries are established in towns and large villages. To bring medical aid to small villages Government have decided to give a trial to a scheme which is known as the Village Aid Scheme. Arrangements are made to train primary school masters in elementary medicine and first-aid help. The work though recently started has been highly spoken of by local officers and there is a demand for an extension of the scheme.

A scheme of subsidising private practitioners to induce them to settle in small towns in rural areas is also before Government.

In recent years, health propaganda is being carried out in various parts of the presidency by Baby Weeks and Health Weeks. This propaganda, though originally started in urban areas, has now begun to reach the villages. An important part of the work of the Public Health Department is vaccination. The number of those vaccinated each year comes to nearly 700,000 persons and as many as 100,000 were re-vaccinated last year.

Half of the total mortality is from fevers. Epidemics like plague and cholera have been very considerably brought under control. The water supply in certain villages gives rise to intestinal troubles. The influenza epidemic of 1918 took a severe toll in most parts of the presidency.